

# TILED SWIMMING POOLS



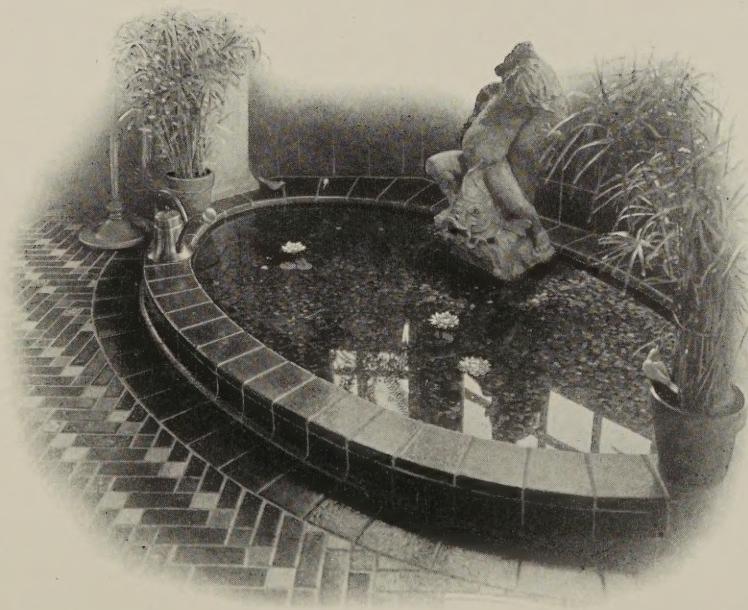
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This publication has a twofold purpose. In the first place, it is intended to serve as a convenient handbook on swimming pools for the information of prospective builders and home owners, and for the reference library of architects and engineers.

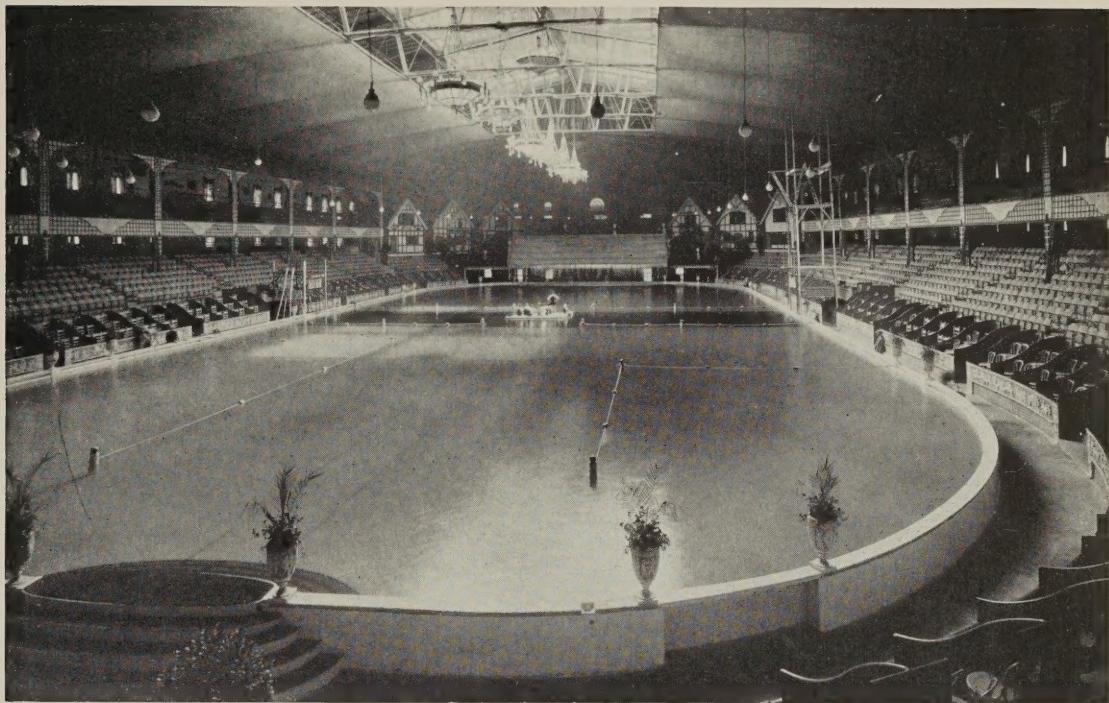
The wide distribution which the first edition has enjoyed, the frequent references which writers on the subject have made to it, and the adoption, as standards, by a number of private organizations and State Boards of Health of the recommendations and ideas presented therein, in addition to its use as a text book in several colleges, indicate that it supplied a real and very definite need.

In this revised second edition, all new data and experience have been utilized, and we confidently believe that it represents a digest of up-to-date methods and the best practice.

In addition, it will point out the numerous advantages of tiles. Countless instances have demonstrated the exceptional fitness and value of tiles for the lining of pools of all descriptions, and in urging their general adoption for swimming pools we do so with absolute faith in their merit for this purpose.

The principles and recommendations in this book are presented as an incentive toward better swimming pools and more of them.

## TILED SWIMMING POOLS



Swimming Pool, Madison Square Garden, New York City  
Franklin Whitman, Architect

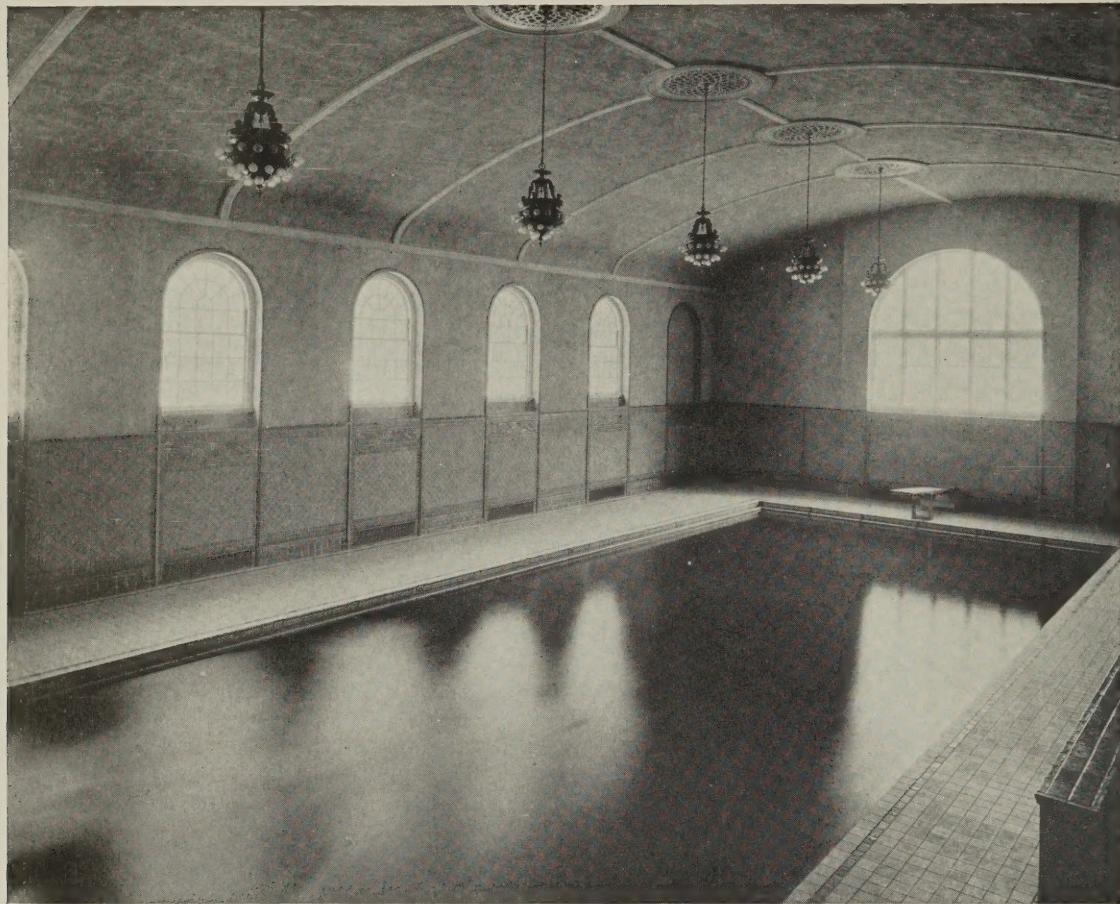
This is one of the largest indoor pools in the world—having ample space for six to eight roped-off playing courts. Note the accessible entrance steps and the artistic use of the tiled coping and decorations.

### Tiled Swimming Pools

**T**ILE is now generally accepted as the most suitable, serviceable and practical material for swimming pools because of the satisfaction it has given in every instance. It has many hygienic and economical advantages. Ever since the first swimming pool was lined with it, tile has been a feature of excellence in swimming pool construction. Hundreds of pools in connection with colleges, Y. M. C. A.'s, municipal and private natatoriums, clubs, and in numerous private residences have been lined with tile with complete success and lasting satisfaction. They render ample proof and evidence of its practical worth and artistic merit.

Among the advantages of tile are cleanliness, durability, attractiveness, comparative lightness, ease of application and reasonable cost. The usefulness of tile is, moreover, not restricted to the pool itself. Tile is equally advantageous and serviceable for floor, walls and ceiling of the hall in which the pool is located, for showers, dressing rooms, toilets, rain and tub baths, and for other supplementary equipment of the modern natatorium.

Tiles always retain their beautiful surface lustre and finish. A tiled swimming pool never shows wear or change of color. Water contact or severe use does not affect the lasting sheen and attractive beauty of clean tiled surfaces. With proper care and cleaning, a tiled swimming pool will last indefinitely in its original freshness and neatness.



*Spaulding Pool, Dartmouth College, Hanover, N. H.*  
Rich & Mathesius, Architects

This 30 by 75 foot pool is lined with  $\frac{3}{4}$ -inch speckled green ceramic mosaic with a gangway of gray flint tiles in 6-inch squares. The wall panels are oatmeal colored Touraine Quarries with glazed faience borders.

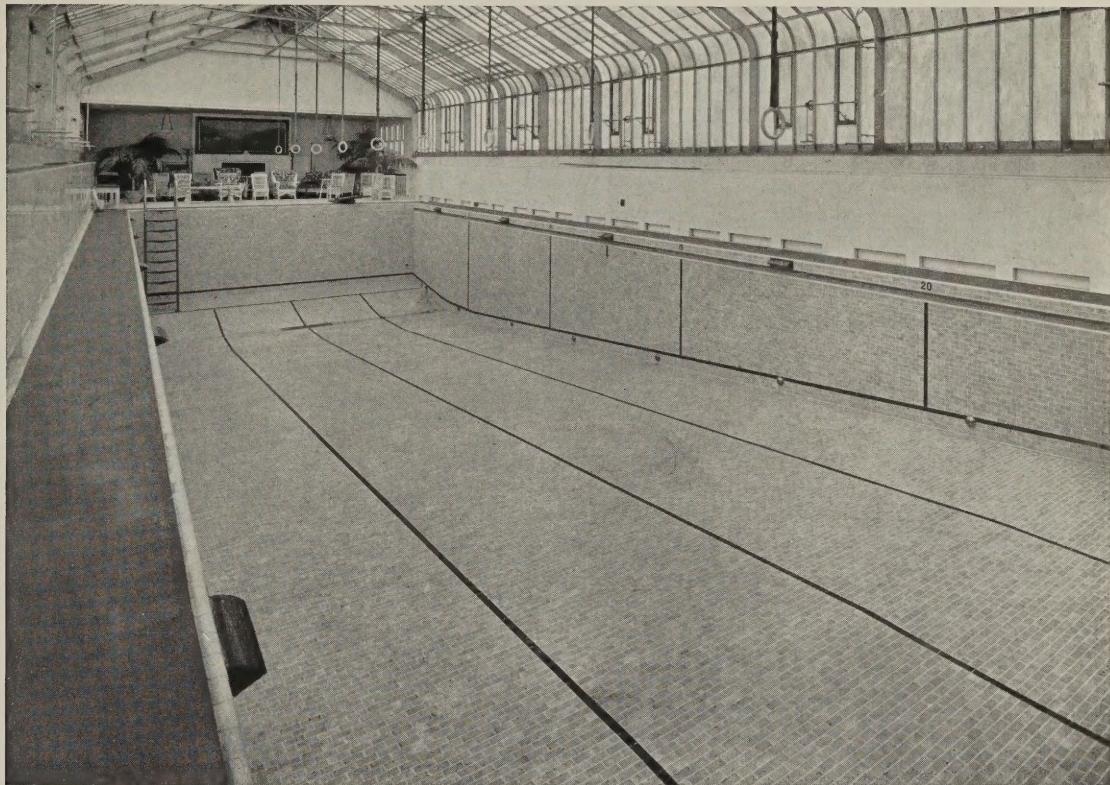
## *Sanitary Value of Tiles*

**T**HE use of tiles for swimming pools is strictly in accord with modern hygiene, which has made its chief advances through the recognition of cleanliness as the essence of proper sanitation. Tiles are indispensable in swimming pool construction for the attainment of that essential cleanliness, and fulfill all practical demands in this respect.

The smooth tile lining facilitates in unusual measure the ease and rapidity with which a pool may be cleaned, and the non-porousness of tiles insures the thoroughness of the cleaning operations. The dense, non-absorbent nature of tiles prevents impurities from penetrating the surface beyond the possibility of ready and complete removal.

The hygienic aspect of swimming pool construction is obviously of the greatest importance. The swimming pool is a place for healthful exercise, and must be kept in a healthful condition at all times. The large amount of impurities carried into the pool makes it necessary for the designer to be alive to the dangers of absorbent pool lining materials, as well as to those of wide, porous joints.

## TILED SWIMMING POOLS



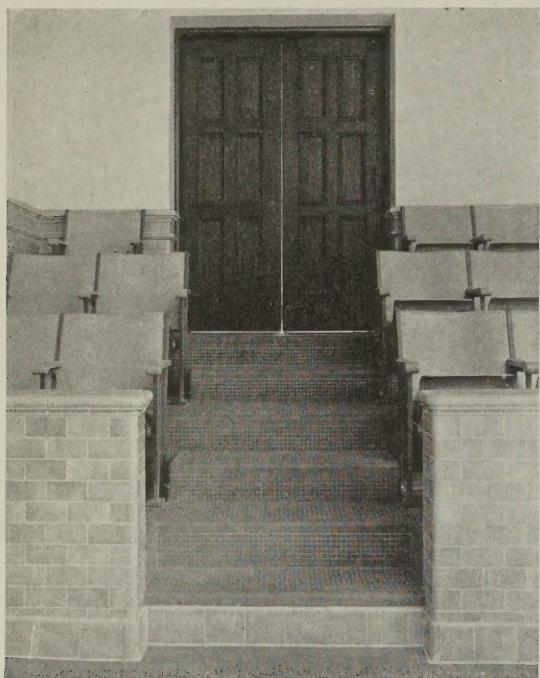
Private Swimming Pool, Residence of C. H. Wills,  
Detroit, Michigan  
Albert Kahn, Architect

An ideally located private pool of light green glazed tile with black swimming lines along the bottom. At the spring-board end is a tastefully appointed lounging room is provided.

A distinction should be made between absolute and apparent cleanliness. The mere fact that dirt does not show does not always mean that dirt is not present. Only thorough cleansing can remove dirt and bacterial growths, and in tiles a material is available which permits and assures a complete cleansing process. Rounded corners and covers are provided for simplicity of construction and tile scum gutters for the automatic removal of floating impurities. Simplicity of cleaning is not only desirable but absolutely necessary, because very few pools are so fortunately situated that the water may be changed daily and frequent cleanings permitted without extraordinary expense.

A factor that lends additional desirability to the lighter shades of tiles, from a sanitary point of view, is their light-reflecting property. The germicidal effect of reflected light should not be underestimated in view of the fact that many pools are so located that they do not receive direct sunlight, or, at best, they receive only a comparatively small amount. Experiments have revealed that certain bacteria and spores are killed by direct sunlight, and that the result from reflected light is similar, although slower.

Fresh, bright tiles today hold the unqualified endorsement of sanitarians, architects, physical directors, and owners as the cleanest, most durable and wholly satisfactory lining material for sanitary tiled swimming pools.



*Ida Noyes Hall, University of Chicago, Chicago, Ill.*

Shepley, Rutan & Coolidge, Architects

Detail of tile steps and partition. The dark green ceramic mosaic is carried over the entire floor space under the seats, thus facilitating cleanliness in a place offering innumerable obstructions.

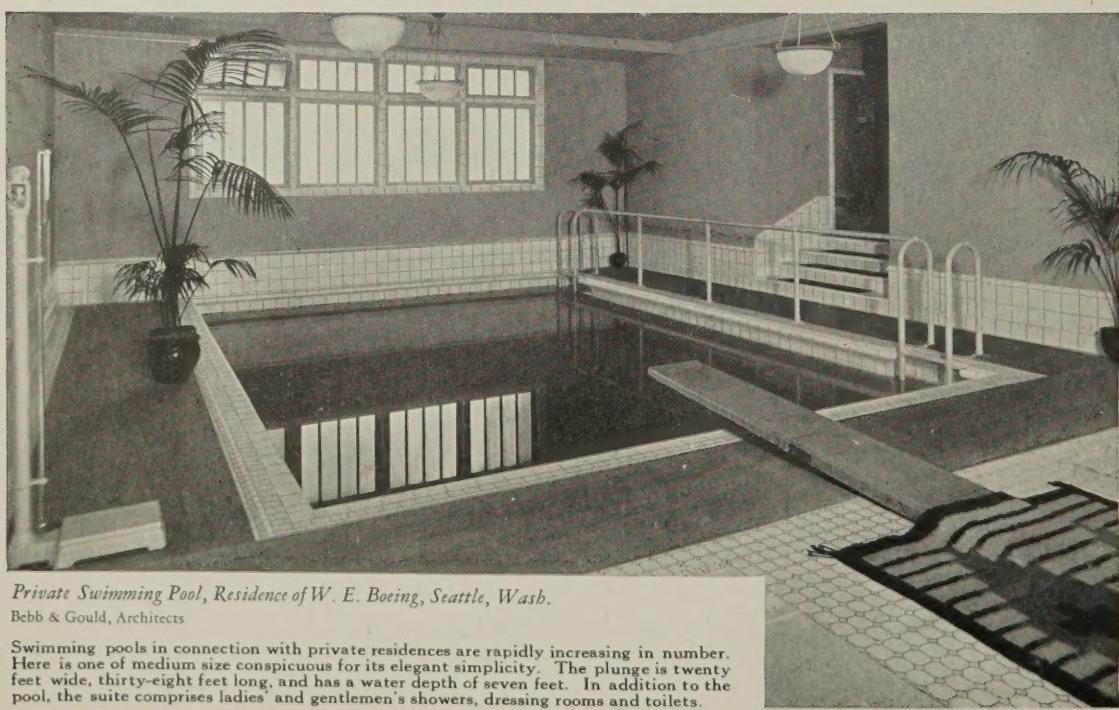
the essential requirements of durability are hardness, which prevents abrasion, and inorganic chemical composition. Tiles are the most durable of materials, and being produced solely from clay, feldspar and flint, are, of course, entirely inorganic and cannot possibly decay or disintegrate.

## *Lasting Qualities of Tiles*



ANOTHER point in favor of tiles is their extreme durability. Absolute reliance may be placed upon their lasting qualities. It is a noteworthy fact that tiles are immune from detrimental chemical or mechanical actions of the pool water, or other leaching and dissolving influences. Continuous contact with water has no deteriorating effect upon tiles. This applies in equal measure to all kinds and colors, to ceramic mosaic as well as to tiles and faience of larger units made by the ASSOCIATED TILE MANUFACTURERS.

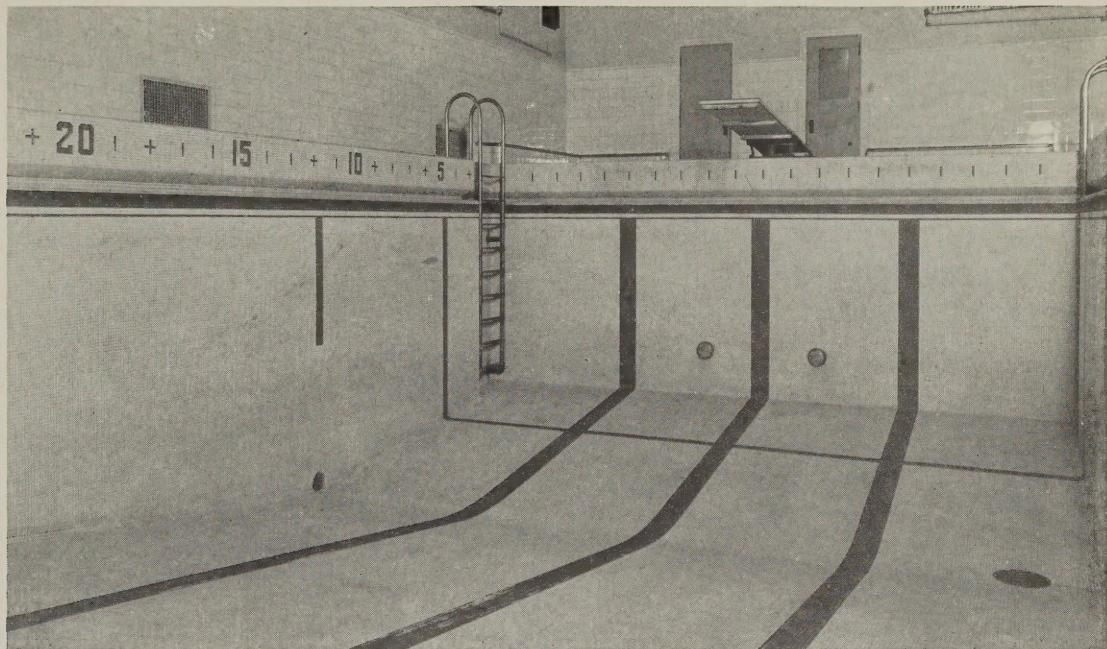
Permanence of a swimming pool installation ranges in importance next to healthfulness, and is as much a matter of economy as it is one of safety. Two of



*Private Swimming Pool, Residence of W. E. Boeing, Seattle, Wash.*  
Babb & Gould, Architects

Swimming pools in connection with private residences are rapidly increasing in number. Here is one of medium size conspicuous for its elegant simplicity. The plunge is twenty feet wide, thirty-eight feet long, and has a water depth of seven feet. In addition to the pool, the suite comprises ladies' and gentlemen's showers, dressing rooms and toilets.

## TILED SWIMMING POOLS



Swimming Pool, Cass High School, Detroit, Mich.  
Malcomson, Higginbotham and Palmer, Architects

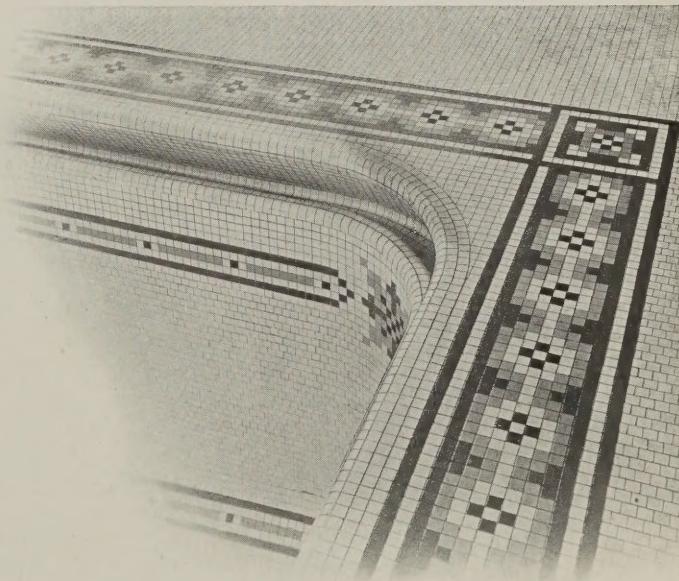
The floor and walls of this pool are lined with unglazed tiles and glazed tiles were used for the wainscoting. Note the tile markings for distances and swimming lines.

### Decorative Value of Tiles

**P**THE tonic effect which should result from a plunge depends in a large measure upon attractive surroundings. As cleanliness contributes much to attractiveness, so should a due share be allotted to attractiveness for bringing about this invigorating effect. There are numerous reasons why tiles make an artistic material for appropriate and beautiful decoration. They afford the designer abundant opportunity for the expression of any artistic value, for variety of color, textures and new designs.

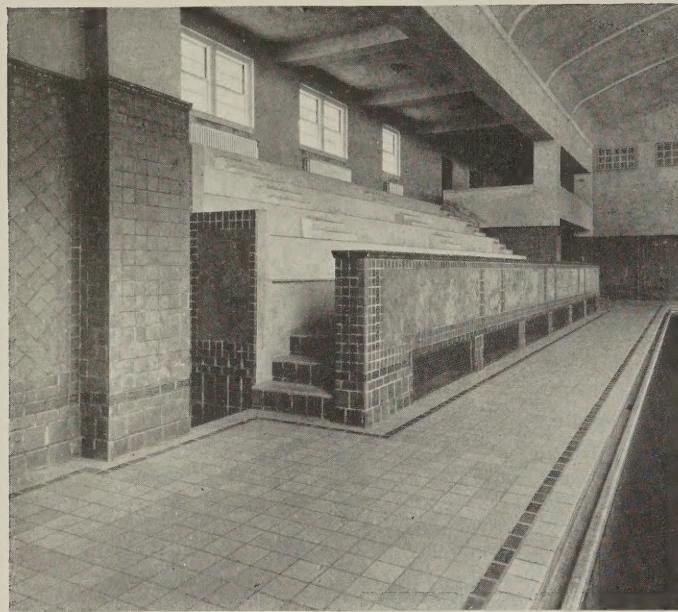
A great variety in effects may be obtained by multiplication of units, by different finishes—bright glazed, satin, dull and unglazed—and by units of different size and shape. Owing to the almost unlimited range of sizes, shapes and colors, the architectural scale can always be preserved and any decorative scheme executed in harmony with the surroundings.

A singular advantage of tile decorations is their durability, and in this connection, the permanence of the colors requires special mention. All tile colors are durable and cannot fade from the chemical effect of light or any other influence. There is beauty and serviceability in all of them; they make the pool attractive, more inviting, and thereby increase the lure, the delight and the fun in swimming.



Detail of Scum Gutter  
Racine College, Racine, Wis.  
Guilbert & Funston, Architects

The corner of the gutter is amply rounded to facilitate sanitation.



*Spaulding Pool, Dartmouth College,  
Hanover, N. H.*

Rich & Mathesius, Architects

Note the decorative uses of tiles in these wall panels and the faience borders.

consider a tiled swimming pool an essential part of the standard athletic equipment. In addition to regular swimming exercises and instruction to the students by a competent director, the indoor pool permits the various aquatic sports such as water polo, water basket ball, swimming races, plunges, dives, etc.—now popular in college and school circles.

The clean, attractive swimming pool has been definitely capitalized by clubs, athletic associations, Y. M. C. A.'s and Y. W. C. A.'s as a real drawing card for new members. Guests and newcomers in the community are impressed by the opportunities it affords for good fellowship, the keen rivalry of healthy sport, and as the opening for new friendships with active people. For the typical youth of the crowded city, there is no more powerful magnet than the delighted splashing in a cool, bright, tiled pool—the modern improvement of the "ole swimming hole."

The tired guest at many big metropolitan hotels today can enjoy his invigorating plunge in a clean, tiled pool without leaving the hotel building. Attractive swimming pools are a pleasing feature of the better summer resort hotels throughout the country.

Civic centers and public playgrounds have found the community swimming pool idea to be replete with new possibilities. The public can use the pool at advertised periods of two or three hours each evening; swimming classes for pupils and games for children can be held at fixed hours during the morning and afternoon.

The best and most popular location for the indoor pool is the basement, although many clubs and hotels in high buildings have a pool on one of the upper floors. While a separate structure is often erected for the pool, it will be found more practical and economical to locate the indoor swimming pool in a building already erected—preferably in the basement.

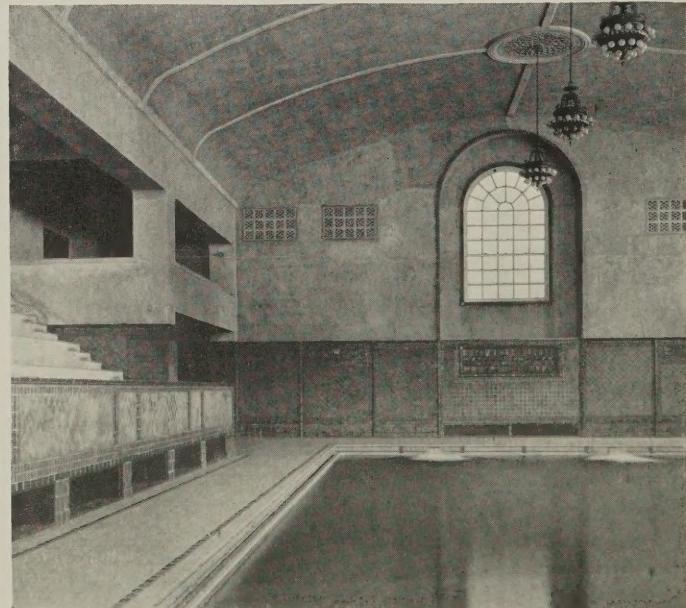
## Indoor Pools



N indoor swimming pool has many obvious advantages over the outdoor pool. Being located in a heated building, it can be used the year around. The water can be heated to any desired temperature for winter swimming or water sports. The cost of refilling, cleaning and maintaining indoor pools can be considerably reduced by efficient filtration and purification equipment operating with a recirculating system of adequate capacity.

The indoor pool satisfies many requirements of the modern public school. First, it permits instruction in swimming to the pupils during regular periods. It also encourages active exercise and builds up good health through clean, robust bodies and refreshed minds.

Colleges and universities today con-



*Spaulding Pool, Dartmouth College,  
Hanover, N. H.*

Rich & Mathesius, Architects

Another view of this attractive pool shows the decorative value of faience in the lettered memorial plate.

## TILED SWIMMING POOLS



Open-Air Swimming Pool, Summit Beach Park, Akron, O.

This commodious pool has drawn the crowds continuously since its completion in July, 1919, despite the fact that bathing is free in Summit Lake directly adjoining it. It is 175 feet long and 80 feet wide, and is tiled throughout with vitreous ceramic mosaic in  $\frac{3}{4}$ -inch squares, including depth and distance markings and swimming lanes.

### Outdoor Swimming Pools

OUTDOOR pools are for warm weather use only and usually have no covered enclosure. They are filled with water of natural temperature which can be easily and constantly renewed.

Outdoor pools are suitable for public parks and playgrounds, civic centers, amusement parks, beaches and private gardens. Many communities have built both outdoor and indoor pools, abandoning river and lake beaches, because pools afford better facilities for the supervision and control of bathers than is possible at rivers and lakes. Many amusement parks have found the outdoor tiled swimming pool to be a profitable investment as a good money-making proposition—even when located in close proximity to lakes and rivers where bathing is free.

The construction of outdoor and indoor pools is essentially the same; the type or method is largely influenced by the nature of the soil, climate and natural drainage conditions. Special attention must be given to the waterproofing of outdoor pools.

The demonstrated superiority of tiles for outdoor pools is well established. Unglazed tiles and ceramic mosaic are best suited to all climatic conditions. Tiled walks should surround the outdoor pool. They harmonize with the green and brown of nearby grounds, and add distinctive charm and a neat finished appearance to the entire pool.



Private Pool, Residence Robert R. Meyer, Birmingham, Ala.

W. H. Kessler, Architect

This distinctive and inviting pool has a terrace and curb of 6-inch rough texture promenade tile, and a scum gutter and pool lining of ceramic mosaic with black outlines. The bath house contains two white glazed tile showers with ceramic floors.

In deciding on the plan and design for an outdoor pool, it is often best to make a sharp distinction from the usual stereotyped design for swimming pools. By so doing, a novel and pleasing effect can be obtained which will blend smoothly into the unique features of the surrounding landscape and the natural terrain. Distinctive features can be made of steps, platforms and ladders to conform with the general architectural scheme of the nearby buildings. As a rule the outdoor pool is not limited for space, nor is it always necessary to secure swimming space over the entire area of the pool, thus permitting closer attention to the important auxiliary details of trimmings and accoutrements.



*Private Pool, Residence P. G. Thomson, Cincinnati, O.  
J. G. Rogers, Architect*

Three-quarter-inch vitreous ceramic mosaic was used to line this picturesque garden pool and has proved entirely waterproof.

## *Garden Pools*



ARDEN pools may be for swimming or for purely ornamental purposes. The private garden pool offers a free and unrestricted opportunity for the development of originality and distinction in the outdoor pool.

For the larger estates, garden pools have been in vogue for a long time, and today garden swimming pools are being provided in greater and greater numbers for grounds of an acre or even less, where the entire family can enjoy swimming at home and in seclusion.

The architectural features of the garden—its arbors, gateways, walls, fountains and garden pools—are not only important sources of interest in themselves, but they are the means of completing the garden, of rounding it out and imparting to it a finished appearance. Garden pools, like garden walls, should conform to the architectural style of the main house, for the garden and whatever pertains to it ought to be part of an harmonious whole; one should be able to pass easily from one to the other, feeling that each belongs to the other.

An attractive, well-placed garden pool makes a most delightful and unique addition to the private estate, and particularly so in the country or suburbs. A

## TILED SWIMMING POOLS

modest basin, 12 x 20 feet or smaller, can be built at comparatively little cost—with tiled sides and bottom, an open overflow trough to collect leaves and seeds that fall upon the water, and a neat tile pavement around the edge. It affords a convenient opportunity for a refreshing early morning plunge under the seclusion of hedges, pergolas, arbors and stately old trees.

Garden pools are often placed in the conservatory, where they may serve both as swimming and garden pools—appropriately lined with ferns, palms and flowers.

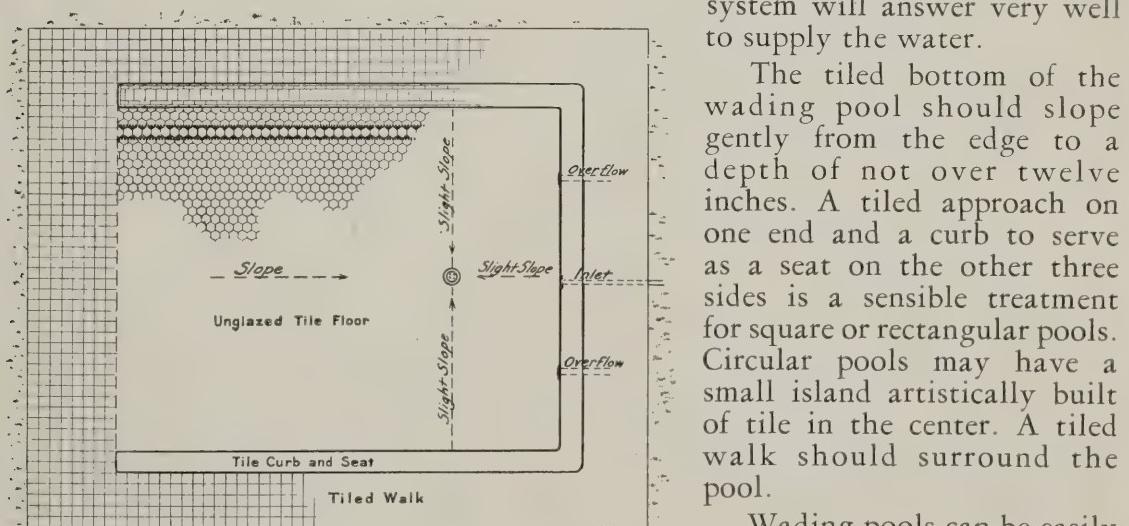


This view of the pool on the opposite page, shown empty, affords a close-up of the pergola, diving board, decorative border of colored ceramic mosaic, and the tiled inset ladder.

## *Wading Pools*

**A**HAPPY variation of the garden pool is the tiled wading pool, where playful youngsters may splash in the water on hot sultry days to their hearts' content. Wading pools can be built at little expense and are suited to the smallest grounds, as any desired shape may be adopted.

No elaborate plumbing is necessary for the wading pool. An ordinary galvanized pipe placed in the ground below the frost line and connected with the house system will answer very well to supply the water.



Suggestion for a Wading Pool

Wading pools can be easily cleaned with the ordinary garden hose and will last forever.



J. G. Rogers, Architect

Garden Aspect of the P. G. Thomson pool shown on pages 10 and 11.

## *Color Schemes*

**H**E artistic sense of the designer, personal taste, and preference must of necessity largely guide in the selection of colors. The varying translucency of the water requires some consideration.

The predominating color in many cases is white, which is of great value where the pool is located in a hall deficient in daylight. In some states ordinances provide that "the sides and bottom of all pools and tanks shall be white, so that objects may be clearly seen, so far as possible, in all portions of the pool or tank."

However, where the water is more or less turbid, some kinds of colored tiles are more desirable, because turbidity will be less noticeable in a pool finished in color than in a white pool.

The natural greenish or bluish cast of large bodies of



Outdoor Pool, Residence Robert R. Meyer, Birmingham, Ala.  
W. H. Kessler, Architect

Note the restful garden setting and decorative features of this private pool, also shown on page 9.

## TILED SWIMMING POOLS

water may be enhanced by tiles of similar color arranged in decorative borders and panels or as the ground color for the entire pool. A depth of color is thereby produced that resembles that of lakes and clear streams, and looks particularly inviting. Beautiful effects have also been obtained with turquoise blue and borders of azure. Distance numerals,

swimming lines and similar markings are in themselves decorative, or can be made the basis of design and color schemes. A colored border along the water line is both beautiful and serviceable. Where stairs are built into the pool, it is advisable to have the treads in some distinctive color easily visible below the water.

One recently finished pool on a southern estate has blue ceramic mosaic and blue vitreous tile for the scum gutter and top curb, with blue vitreous tile for the nosings of all steps and platforms. The balance of the pool is in white ceramic mosaic, and on the floor are two broad bands of blue ceramic mosaic, each band three feet wide, running the full length of the pool. This simple use of just two colors, with nothing but blue visible above the water line, and the two bands on the bottom showing up through the water, with the reflection from the blue southern sky, produced a wonderfully rich color effect due to the bluish cast imparted to the water by the colored tiles and also from the sky reflection.

Each natatorium is, of course, a problem in itself. The possibilities with tiles in color are practically limitless. Other suggestions may be derived from the notes under the illustrations.



Outdoor Pool, Residence John L. Kaul,  
Birmingham, Ala.

W. H. Kessler, Architect

White glazed tiles were used for this scum gutter; Hoods Red Quarry tile for the promenade; and Oriental brick for the curbing. The bath house has tile showers in each side with ceramic mosaic floors and 6-inch squares in a combination cove base in dressing rooms.



Private Outdoor Pool, Arthur Curtis James, Cocoanut Grove, Fla.  
J. Clinton McKenzie, Architect

Ceramic mosaic was used in floor and walls of this pool. Note the wide entrance steps, garden bench and floral decorations.



Another view of John L. Kaul pool illustrated on page 13 showing two sets of wide entrance steps from residence and also entrance steps at other end of pool.

## *Layout and Plan*

**I**N the construction of the pool proper, there is no essential difference between the outdoor and indoor pools. But the layout of the bathing establishment will differ according to location, purpose, the number, age, sex and character of the bathers, so that there will be considerable variation in the size and depth of the pool and the general arrangement of such units as dressing rooms, showers, toilets, etc. In addition, many states and municipalities have enacted laws and regulations pertaining to public swimming pools, which will influence the planning.

The general requirements may be summarized in the following principles:

1. The dimensions of the pool depend upon the expected attendance. A pool should be built as large as probable attendance and finances dictate.
2. The pool should be surrounded by runways on at least three sides. These gangways should have a minimum width of four feet.
3. Dressing rooms and showers should be so arranged that proper supervision is possible at all times.
4. Entrances, aisles and dressing rooms should be so arranged that any dressed person or newcomer on his way to the dressing room cannot mingle with bathers in the pool room or enclosure.
5. Separate dressing rooms, showers and toilet sections are necessary where both sexes use the pool at the same time. Dressing rooms may be individual or common for the respective sexes.
6. Where only men and boys use the pool, common dressing rooms with lockers are preferable.

## TILED SWIMMING POOLS

7. For women and girls, individual dressing rooms or stalls are advisable, and bathing suits and caps should be furnished.
8. When the pool is used alternately by both sexes, the dressing rooms, lockers and showers for men should be placed on one side and those for women on the opposite side, or there could be a single set for alternate use by both sexes, with separate toilets when possible. The first plan is desirable for schools, especially when folding partitions are provided by means of which either set of accessories may be disconnected from the pool. This offers the advantage that those of one sex may use its showers and prepare for the pool while those of the other sex are using the pool.
9. The number of dressing rooms depends on the expected attendance and should be proportionate to the size of pool. For schools, Y. M. C. A.'s, etc., this attendance is easily determined, while for public bath houses, the number is not so easily calculated. However, the maximum bathing load, as determined by the volume of the pool and the capacity of the purifying equipment, furnishes a guide to the required dressing room area.
10. Showers should be installed adjacent to the pool room and convenient to the toilet rooms. In case of men's swimming pools, when suits are not worn, the showers may well be located in the pool room itself.
11. In no case should showers be so located that any bather can go from dressing room to pool without passing by, or preferably through, a shower room.
12. Not less than one shower head and liquid soap container should be planned for each 30 individual dressing rooms or their equivalent.
13. Toilets should be so located as to afford easy access. Some of them should be so located that newcomers may find them on their way to dressing rooms. Others should be located between dressing rooms and pool, so that they may be reached by bathers from the pool room.
14. Not less than one toilet fixture shall be provided for every 25 bathers.



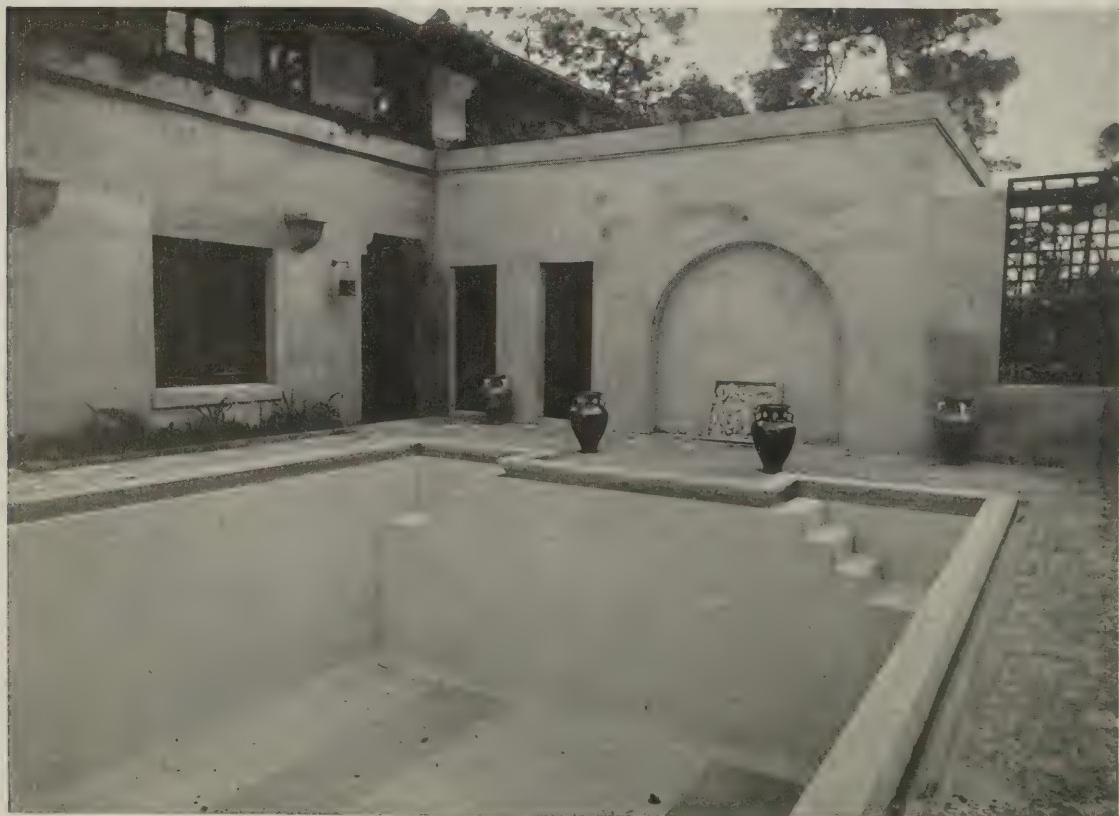
*Tropical Tea House and Swimming Pool,  
Residence of Captain J. R. DeLamer, Glen  
Cove, Long Island, N. Y.*

Architect: C. P. H. Gilbert

This unique circular pool is delightfully hemmed in by a veritable fairy bower of rare tropical plants, gracefully hanging vines and flowers. White ceramic mosaic with a border design of gold and azulejo tiles were used, with a vivid color star in several shades of blue, radiating from the tea house in the center.

A S S O C I A T E D   T I L E   M A N U F A C T U R E R S

15. Galleries should be so planned that spectators and persons not dressed for bathing cannot mingle with bathers, and cannot enter the runways, dressing rooms, toilets, etc., used by bathers.
16. Complete recirculating, purifying and heating equipment and proper housing space for such equipment must be provided, where neither the "fill and draw" nor the replacement method of renewing the pool water are used.
17. The pool room for indoor pools should be well lighted and ventilated.
18. For outdoor pools, a site should be chosen that is easily drained of surface water, and is not subject to contamination from incinerators, highways or manufacturing plants.
19. Plans for outdoor pools should not include sand beaches, earth or boardwalks, lawns and similar sources of contamination of the pool water, unless foot pools as mentioned hereafter are provided.
20. Foot pools, 6 to 8 inches deep, should be built in connection with outdoor pools, through which all bathers must go before entering the swimming pool. Such foot pools are also advisable for indoor pools.
21. Where the establishment is frequented by families, separate wading pools for small children are desirable.
22. It should be impossible, in connection with outdoor or indoor pools, for bathers to leave the pool enclosure or dressing room section and return to the pool later without either again taking a shower bath or going through a foot pool over which a shower head has been placed.



Another view of Arthur Curtis James' pool on page 13. Note the treatment of the scum gutter and steps with ceramic mosaic.

## *Selection of Tiles*



NY vitreous or glazed tile made by members of the ASSOCIATED TILE MANUFACTURERS may be used in swimming pool work with entirely satisfactory results. The unglazed varieties are especially suited for the bottom of the pool and the runways. Glazed tiles find their principal uses on the sides of the pool, the gutter, the walls and ceiling of the plunge room and shower stalls.

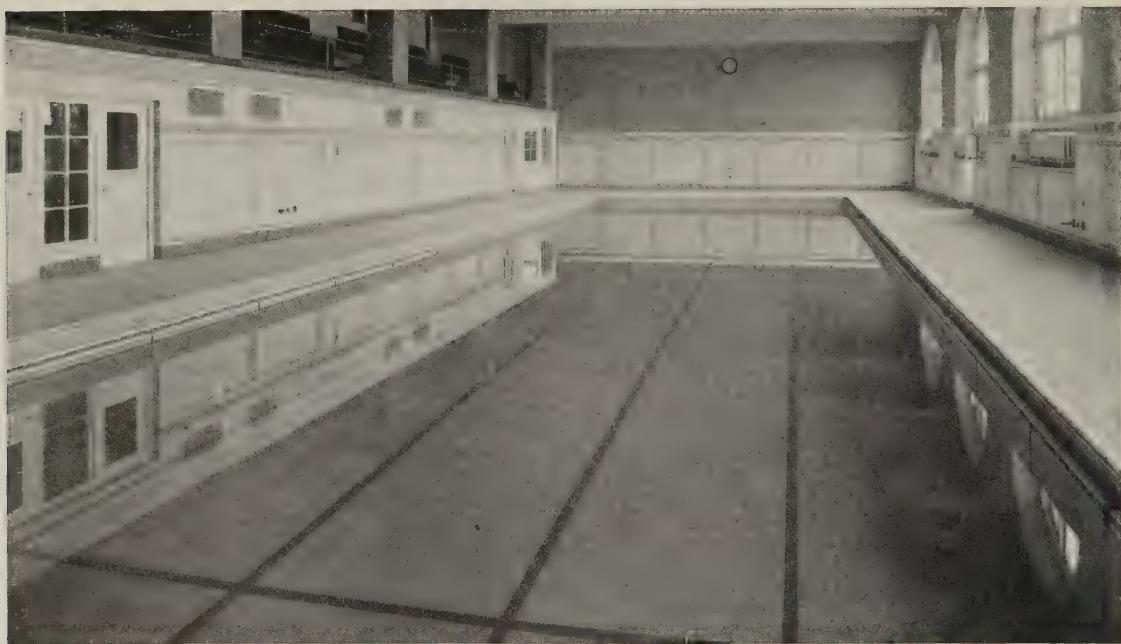
Unglazed ceramic mosaic, because of its low cost, and the rapidity with which it can be applied, is used for the majority of pools. This material is particularly well suited to pool work because of the smallness of the units, so that any contour of the gutter, handrail, curb and coved corners can be easily and smoothly tiled without special shapes. To facilitate economy in installation, the small tiles are marketed mounted on sheets of paper; in this way over 500 of the "tesserae," or the equivalent of about two square feet, can be installed at a time.

For the largest part of the bowl, i. e., the field, white is usually chosen because it is the lowest in cost; and color is used only for the swimming lines and other markings, and for the gutter, handrail and a band eight to ten inches wide below the handrail.

More and more color is used, however, for the entire pool—of which light greens and blues predominate. The object is of course to enhance the natural greenish or bluish cast of the water. The same material is also obtainable in white or colored glazes. Either bright or dull glazed mosaic is recommended where particular brilliance in the effect and the greatest ease in cleaning are desired. Frequently the bowl proper is done in the unglazed, and the markings and gutter in the glazed material.

Larger tiles up to six-inch squares are also used in white and delicate tints with unglazed tiles for the floor and glazed tiles for the sides. For private indoor pools especially, the larger sizes of tiles are frequently preferred.

Outdoor pools should always be tiled with ceramic mosaic, unglazed vitreous, or glazed tiles having a vitreous body, such as faience. This recommendation is made, because only vitreous tiles or glazes on vitreous body are entirely weather-and frost-proof. Otherwise, the choice of one kind over another rests entirely with personal preference. There is no difference in suitability, lasting or sanitary qualities. The decorative value of different kinds of tiles, and even individual pieces, varies greatly, of course, and selection from samples is the only method whereby their suitability for any particular installation should be finally determined. Tile contractors should be requested to submit samples for selection.



*Men's Swimming Pool, Central Y. M. C. A., Brooklyn, N. Y.  
Trowbridge & Ackerman, Architects*

A singularly attractive installation. Dark tile lines along the bottom divide the pool longitudinally into swimming lanes.

## *Size*

**F**N arriving at the required size of the pool it is necessary to consider, aside from available space and funds, such points as probable attendance, length of bathing day, bathing load, Board of Health regulations, and requirements for water sports. In general, the aim of the designer should be to establish dimensions and proportions which will result in an effective minimum of water volume, since the water content naturally determines the required capacity and cost of filters, heating and disinfecting equipment, and general construction costs.

The probable attendance furnishes the most important factor upon which the minimum contents of the pool should be determined. The actual or probable attendance in relation to the water contents is known as the "bathing load." Some states have enacted regulations in which the maximum weekly or daily bathing load is fixed. The maximum bathing load may be calculated by dividing the total actual or probable attendance by the actual or proposed pool capacity in thousands of gallons.

## *Shape*

**A**MOST desirable shape for an indoor swimming pool is rectangular, because it provides as long a swimming line as possible, and a long, narrow proportion gives relatively better recirculation results. More freedom is left to the designer of outdoor pools, and indeed, almost any conceivable shape can be found among them. It is, however, not advisable to adopt odd shapes on account of the increased difficulties of construction and consequent greater cost of the completed pool.

## Contour

**T**HE shape of bottom is an important feature, especially where patronage includes children, and in schools. The water depths must be regulated in accordance with requirements. Where pupils of all grades are to use the pool, the problem is quite complex; it is simplified when only the higher grades need the pool. There is still a difference of opinion about the value of swimming instruction in the lowest grades.

The so-called spoon-shaped bottom is now recognized as the most serviceable for all purposes (A). Its merits are easily discernible. It gives the greatest depth about twelve or fifteen feet from the end wall, where depth is most needed, and the pool can be drained completely in a very short time. For the smaller sizes of pools the single spoon (A), and for the larger sizes the double spoon (B) are recommended. The latter provides the necessary playing area for water sports.

An older form of bottom is shown in (C). Here the pool has a uniform depth for one-third the length at either end with a sloping center portion. Where separate sections for swimmers and non-swimmers or for adults and children are desired, this contour is usually adopted.

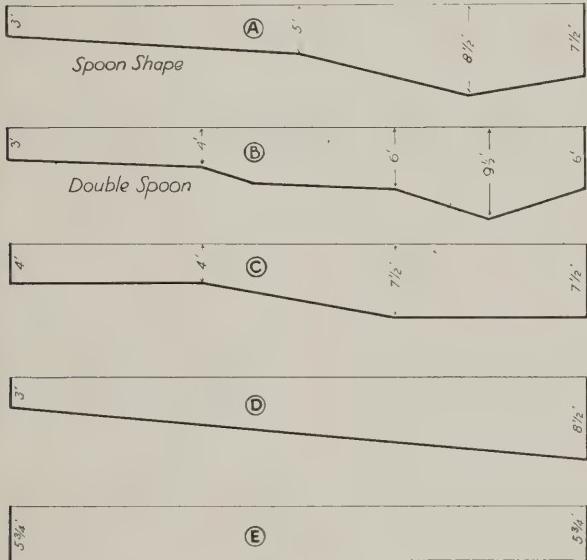


Diagram showing various contours of bottom for comparison of merits.

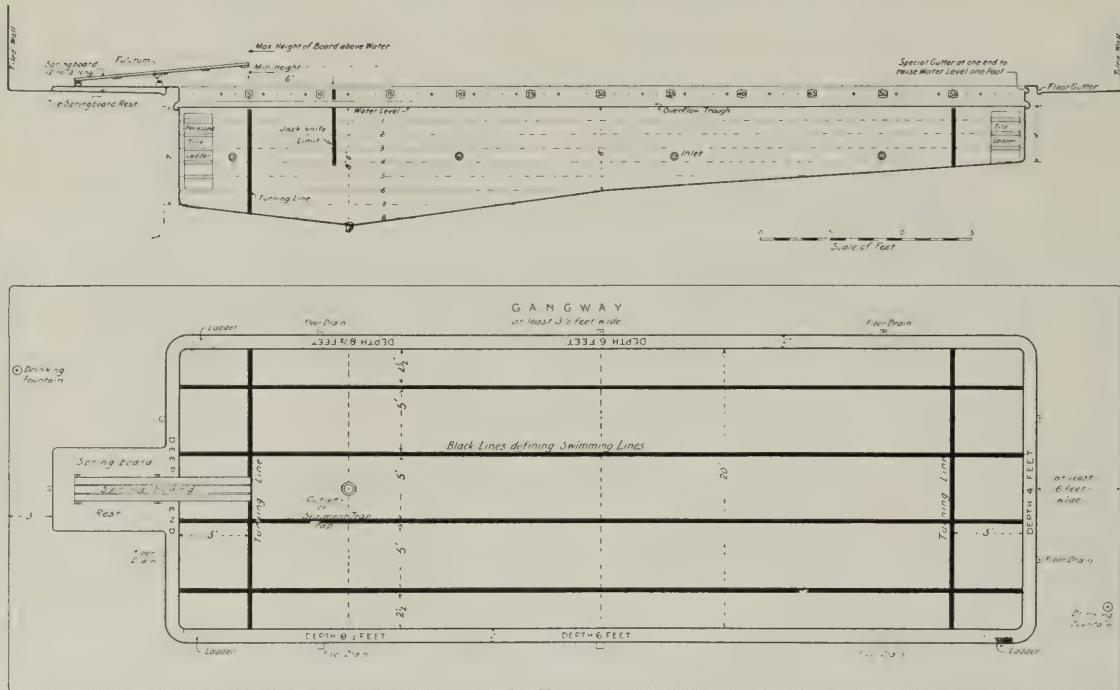
## Length

**W**HILE proportions for private pools are of secondary importance, pools designed for educational institutions, for Y. M. C. A.'s, etc., should always have the length a multiple of fifteen feet for convenience in measuring distances for competitive work.

Rule II, Sec. 1, of the American Swimming Association Rules provides that "Pools for championship meets shall be at least 60 feet in length, 20 feet in width;" and further: "Records made in pools of less than 60 feet in length shall not be considered as official." This rule immediately eliminates pools of smaller size.

An analysis of the seventy pools listed in the American Swimming Association Guide gives a mean value for length of 66.64 feet, a maximum length of 100 feet and a minimum of 30 feet. Twenty-nine of the pools (or 41.1 per cent.) are 60 feet in length; seventeen (or 24.3 per cent.) are 75 feet, and four (or 5.5 per cent.) are 100 feet in length. Prof. Hastings reports almost identical proportions in the forty-five pools investigated by him. His mean value is 60.1 feet, the maximum 100 feet and the minimum 26 feet. The most frequent value is 60 feet, of which he reports sixteen out of forty-five (or 35.5 per cent.).

# A S S O C I A T E D   T I L E   M A N U F A C T U R E R S



*Plan and Elevation of a Typical Swimming Pool.*

The pool is planned as a standard for swimming and diving events. It is, therefore, sixty feet long and twenty feet wide with a modern spoon-shaped bottom, has four swimming lines with turning lines at both ends, and has the jack-knife limit and distances marked on the sides. The relative position of the diving board has also been indicated in diagrammatical form.

## Depth

**H**E general depth as well as the distribution of the areas of different depths depends a great deal on the type and age of bathers. A distinction should be made between adults, children, swimmers and non-swimmers.

The greatest depth should be below and a little ahead of the end of the diving board. Where the pool is intended principally for non-swimmers and children, the shallow water area should be increased over the normal shallow area.

As a guide for depth, reference is again made to Rule II, Sec. 1, of the American Swimming Association Rules: "Pools for championship meets shall . . . . have a water depth of at least seven feet in the deep end and not less than three feet in the shallow end." Rule XI, Sec. 4, provides that "The minimum depth of water in all college diving competitions shall be seven feet."

In practice, this minimum depth will, however, be found inadequate, for none but experienced divers can safely perform the feat in seven feet of water. Statistics show the majority of pools to have a depth of over seven and one-half feet, with a maximum of ten feet. Eight, and eight and one-half feet, are the least depths where diving contests are to be held. This will also facilitate the playing of water polo and similar games which require a playing area over six feet deep for at least sixty feet of the length of the pool, according to the rules of the game.

## Width

**R**OST typical widths group around multiples of 5 feet. Of the seventy pools referred to before, 24.3 per cent. are 20 feet wide, 22.9 per cent. are 25 feet, and 21.4 per cent. are 30 feet in width. The mean value is 26 feet, the maximum 60 feet, and the minimum 17 feet. Again taking Prof. Hastings' figures for comparison, we have a mean value for width of 20.7 feet, a maximum of 60 feet and a minimum of 12 feet. He also finds 20 feet the most frequent value.

Typical pools according to these figures are therefore:

20 x 60 feet	20 x 75 feet
25 x 60 feet	25 x 75 feet
30 x 60 feet	30 x 75 feet

with the 20 by 60 foot pool predominating. This size has been adopted as the standard for Y. M. C. A. pools. It is unfortunate that less than half of the pools cited above (or 47 per cent.) are of typical dimensions, and that the other half cannot be used for competitive games because they are of odd dimensions, the difference often being only one foot.

## Lines and Markings

**D**ISTANCE and depth numerals, swimming and safety lines, are permanently and attractively marked by means of tiles of distinctive color. Along the face of the coping on either side of the pool may be inserted figures for each five-foot interval. The intermediate foot spaces are usually indicated by a short colored line. Ceramic mosaic is particularly well suited for this purpose. All distance markings should begin at the deep water end. Accuracy in this work is imperative.

In compliance with the rules of the American Swimming Association, certain lines should be incorporated into the tilework, namely, swimming lanes should be established lengthwise along the bottom of the pool. Dark colored tiles, at least three inches wide, or their equivalent in ceramic mosaic, are recommended to mark such lanes distinctly.

The number of lanes depends of course on the width of the pool. Each lane should be five feet wide, so that four lanes are established in pools twenty feet in width, five in pools twenty-five feet wide, six in those of thirty feet in width, and so on.

There is now a tendency to get away from *lanes*, which require the swimmers to stay between two lines, and substitute swimming *lines*, over which the contestants must keep during the competition. It is claimed by swimming coaches that it is much easier to keep over a line than to swim in a lane.

A limit of safety for non-swimmers may be indicated prominently by a similar line running across the bottom of the pool and up the sides. In some pools this is, however, taken care of by

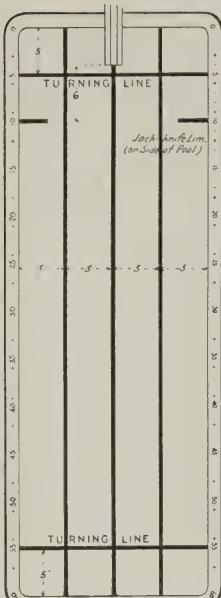


Seattle Natatorium, Seattle, Wash.

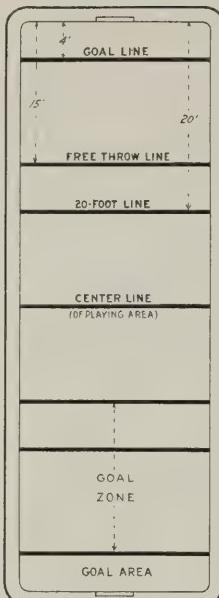
B. Marcus Pretica, Architect

There are two swimming pools in this natatorium. The one shown here is sixty by one hundred feet. Adjoining is the ladies' pool, eighteen by thirty and one-half feet in size. Both are lined with ceramic mosaic tile. Electric lights are counter-sunk into the bottom for under-water illumination.

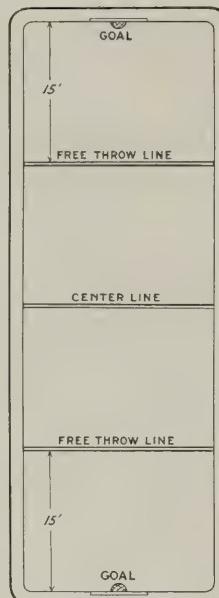
# ASSOCIATED TILE MANUFACTURERS



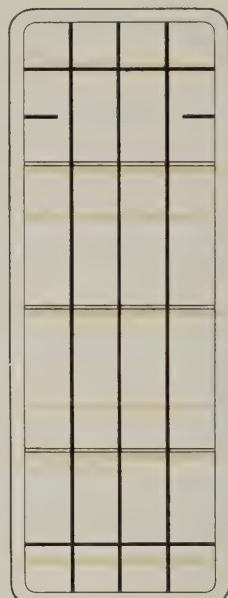
Official swimming lanes, turning lines and jack-knife limit.



Official playing lines for water polo.



Official playing lines for water basket ball.



Composite of official markings for a standard pool.

signs worked out in tile on top of the coping or curb. Five feet from each end of the pool the "turning lines" must be inserted along the bottom and up the sides in similar manner.

The "Jack-knife Limit" should be marked by a distinctly colored line inserted into the face of the coping and running a short way below the surface of the water, six feet from the end of the diving board on each side of the pool, since contestants when executing any jack-knife dive must enter the water within six feet from the end of the diving board. These lines are necessary to assist the judges in determining fouls, and are required in the rules.

For pools where Water Polo is to be played, an area of sixty to seventy-five feet in length, twenty to forty feet in width, and at least six feet in depth should be laid out. This area may be shortened in pools having a shallow end, so that a six-foot depth is assured in the playing area. The following playing and goal lines are then laid out from the ends of this area:

Center Line: equidistant from the ends.

Free Throw Lines: 15 feet from the ends.

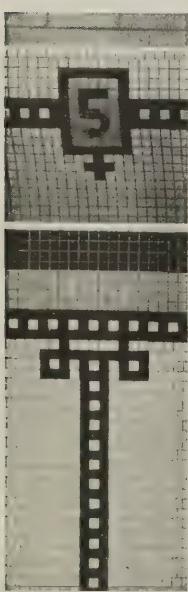
Goal Lines: 4 feet from the ends.

Goal Zones: 20 feet from the ends.

For the playing of Water Basket Ball, any pool free from obstruction and not exceeding 2,500 square feet in area may be fitted by inserting a three-inch tile center line across the bottom or on the sides at equal distances from the ends, and a fifteen-foot line in the same way fifteen feet from each end. Baskets in the form of hammock nets of cord and suspended from metal rings 18 inches in diameter must be placed  $5\frac{1}{2}$  feet above water level at both ends and 6 inches from the backgrounds. The latter are 6 by 4 foot boards extending not less than three feet above baskets.

For high diving competitions, platforms at two heights have to be erected, the first not less than 14 feet and not more than 16 feet, and the second not less than 24 and not more than 27 feet above the water level. These platforms must be seven feet wide, fixed and free from spring.

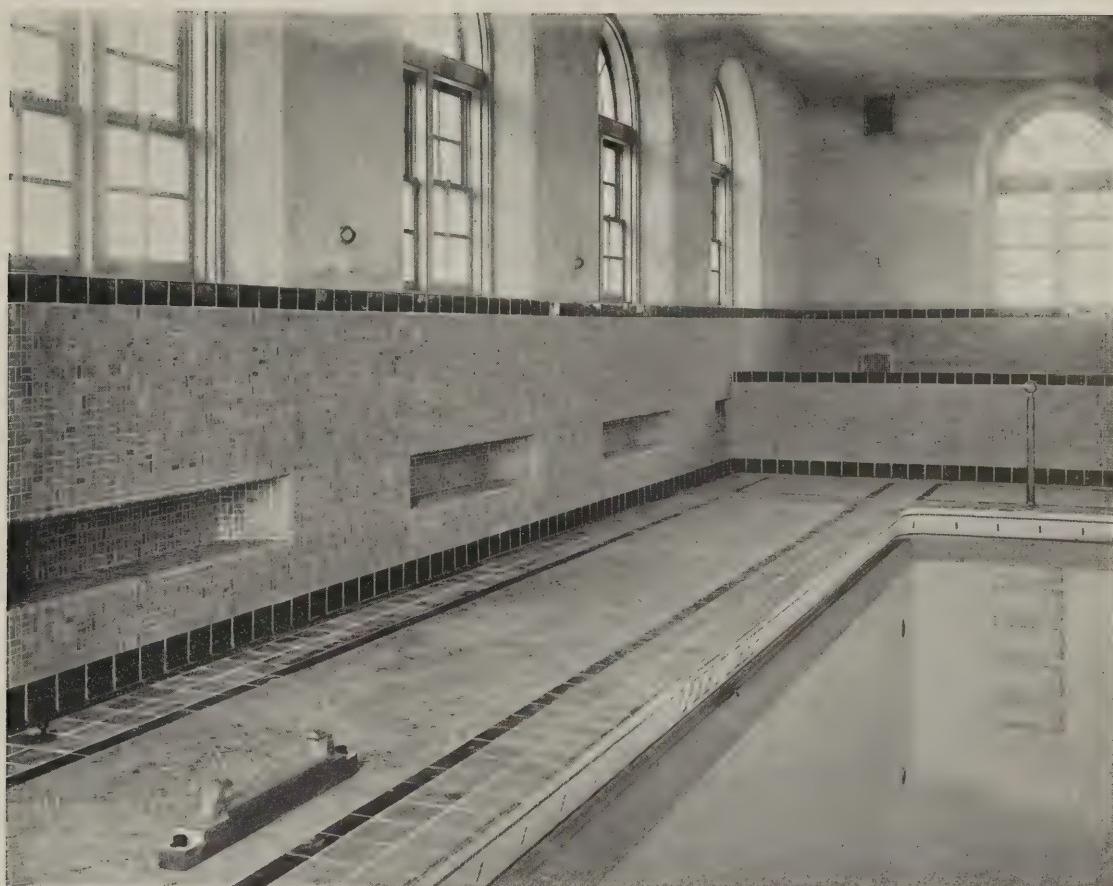
General experience has proved that such provisions for diving, speed swimming and the playing of games add to the enjoyment of the pool and increase patronage.



Detail of a distance numeral along coping.



Showing the use of ceramic mosaic for distance markers and an aerator in the Spaulding pool.

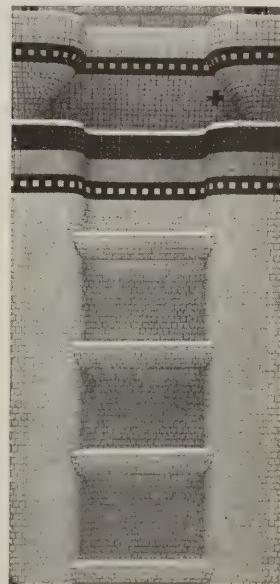


*Indoor Pool, Heckscher Foundation for Children, New York City.  
Maynicke and Franke, Architects*

Note the use of ceramic mosaic for the rail markings, inset ladder and scum gutter on this indoor pool. The curb, runways and wall wainscoting are also tiled.

## Ladders and Steps

**I**NGRESS and egress may be provided by ladders or stairs built into the pool. If the ladders are of metal and fastened to the sides, they should be removable. Metal ladders, however, are rapidly being supplanted by a better and more permanent style which has been developed in the shape of tile ladders. The most satisfactory plan is to build the ladders of tile into the sides of the pool. Each rung or round is reinforced by iron bars rigidly set into the concrete foundation. The ceramic mosaic or tile is either placed around this reinforcement in the shape of an actual round, or carried over additional reinforcement of woven wire in cement to the back end of the recess in the form of a slightly concave step. The former is the style now generally used. In the latter case, an opening must be left through each step to assure complete drainage when the pool is emptied. Tile contractors now cast each rung separately around the reinforcement in cylindrical sheet metal forms of proper cross section with the reinforcement projecting about two inches on each side.



*Detail of Built-in Tile Ladder,  
Y. M. C. A., Beloit, Wis.*

Shattuck & Hussey, Architects

Tile ladders are especially advantageous in all pools for competitive events. They do not protrude, are substantial and are not affected by constant contact with water.

These pre-cast rungs are then set into the ladder recess and cemented into place. This procedure assures not only speed and accuracy, but also simplicity and convenience in installing the tile ladders. The tile is of course not applied until the rungs have been set in place. The tread portion of the rounds or steps is preferably built of unglazed tile to assure a firm hold for the feet, and in black or other distinctive color to make them plainly visible. Where the scum gutter rail forms one of the rungs of the ladder, a point of simplicity in construction is gained.

Since these tile ladders do not project, they are especially advocated for pools where competitive games are to be held. Swimming teachers recommend two ladders at the deep end and one at the shallow end, always placed at the sides of the pool, never into the end walls.

Stairs are still used to a great extent in private and outdoor pools. Overhanging treads should never be built, and the edges formed by tread and riser should be rounded off with a tile bead or curved ceramic mosaic.

## *Overflow Trough and Handrail*

**A**N essential sanitary feature of the modern swimming pool is the tiled overflow trough or scum gutter. It serves four principal purposes:

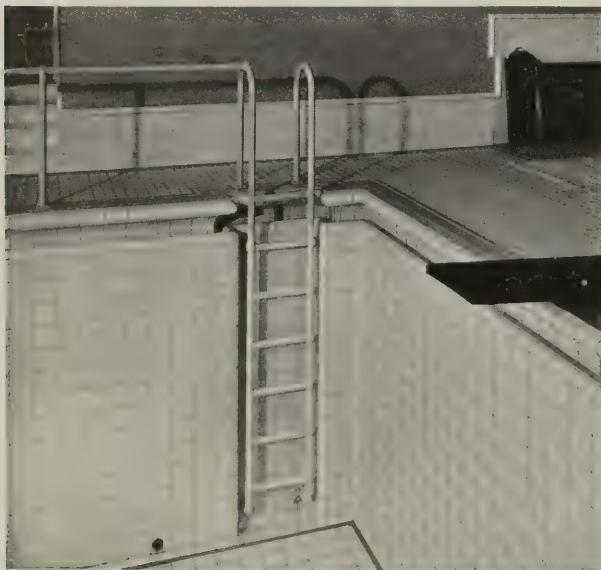
Through the activities of the bathers, it automatically removes from the water surface the bulk of floating substances or scum formed by the accumulation of dead cuticle, exudations of the sweat glands, hair, lint from bathing suits, dust, etc., and flushes them into the waste pipes, provided the water level is always kept within a few inches of the rail.

It acts as an overflow, regulates the depth of water and keeps it uniform. No standing waste pipe should be used for this purpose, because the scum which collects around the opening of such an overflow is not removed in the same manner, the rust from the pipe discolors the water, and the pipe is an objectionable obstruction.

In addition, the gutter serves the important function of a cuspidor that is constantly flushed by the lapping and splashing of the water, and to a great extent prevents expectoration in or about the pool.

Finally, the front or "dam" portion forms a support or "life rail" that in all respects is far superior to the crude and obsolete rope and the obstructing metal rail.

At least two sides of the pool should be provided with these overflow troughs. In view of their important sanitary functions, they are usually installed, however, on all four sides in the majority of modern pools. The occasional practice of providing two gutters at



Detail of Tile Work  
on W. E. Boering Pool  
Shown on Page 6

Bottom and walls are lined with six-inch white tile. The surrounding floor consists of three-inch octagons and one-inch square dots. The overflow trough design has unusual decorative qualities.

## TILED SWIMMING POOLS

different elevations—the lower for ordinary use, the upper for high diving, etc.—has, from all indications, not met with any particular degree of success.

The principles governing the profile and construction of the gutter are simple enough. The capacity, i. e., the depth and width, must be such that all the water splashed into the trough can drain away rapidly and under no circumstances flow back into the pool, as would be the case where the gutter is too small. It should be mentioned in this connection that the size of the gutter changes in an inverse ratio to the size of the pool for the reason that a bather jumping into a large pool will not cause the same stir and overflow as will be the case in a small pool.

The life rail portion must be of comfortable width to the grasp and absolutely level. Great care should be exercised in respect to the latter point, for the slightest error in elevation will become noticeable as soon as the pool is filled. Besides, it is evident that only a perfectly level dam can give satisfactory service.

Drains connecting with a common sewer should be provided at certain intervals and the bottom of the gutter pitched slightly toward these outlets. A comparison of the various possible arrangements of drains, and the resultant effect upon plumbing and depth of gutter, are given in the diagram below, which is self-explanatory. (A) immediately stands out as the most practical and economical method, and provides a gutter of almost uniform depth, with high points between drains twenty feet apart.

A great diversity of practice exists in the matter of profile of overflow troughs, and no standard design can be referred to. There are two distinct types, however; namely, the recessed, and the open or "roll-out-rim" styles. From the cross sections on page nineteen the development of the most effective contours may readily be studied. The recessed type takes away none of the runway space, which is frequently limited, and bathers cannot step into it when sitting on the curb or edge of the pool. The open type is more simply constructed, permits of bringing the water level much nearer to the runway floor level which is often desirable, and is more accessible for cleaning. However, the very fact that it is accessible invites various kinds of



*Indoor Pool, Clarence Saunders,  
Memphis, Tenn.*

H. T. McGee, Architect

This well-equipped pool measures 60 feet long, 20 feet wide and 12 feet deep. The pool bottom has 6-inch squares of pearl gray Flint tiles with black hydraulic tile swimming lane markers. The pool walls and runways have 6-inch squares of dark green Flint tiles, and the scum gutter and curb are ceramic mosaic in dark green, cream and white colors. Note the spoon-shaped bottom.

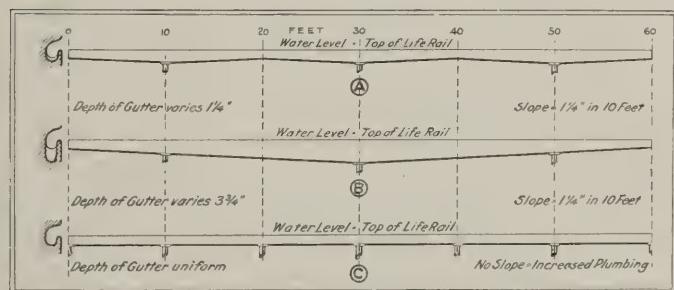


Diagram of various methods of gutter drainage and their effect on depth of gutter and plumbing.

thoughtlessness and violation of sanitary rules. It has also the disadvantage that the bather when entering the pool must step or jump over the open gutter. Each of these types has a number of variants as may be observed from the illustration.

The height of the life rail above the bottom of the recessed gutter has been observed to vary between three and six inches. The usual width or thickness at the top is two inches; a greater width reduces the effectiveness of the gutter and does not afford a comfortable hold to the bather. To give added rigidity, the life rail should be reinforced with expanded metal or metal lath bent to shape as shown in the cross sections.

The inside width of the gutter ranges all the way from three to eight inches. The bottom should be of sufficient width and of the proper contour to accommodate the strainers. In some cases, the drain openings are located in special recesses of the gutter. A long rectangular form of strainer is most desirable—it fits the general form of gutter, is most effective and looks neater. The gutter may be built either of ceramic mosaic or so-called white glazed tile trimmers. Ceramic mosaic yields any desired profile; the designer who chooses it is therefore at liberty to give any contour to the dam and gutter.

Attention is called to the possibility of constructing certain portions of the pool of ceramic mosaic and the remainder of white glazed tile.

## Curb

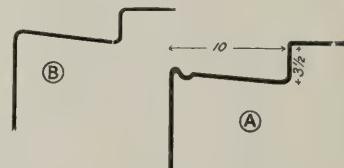
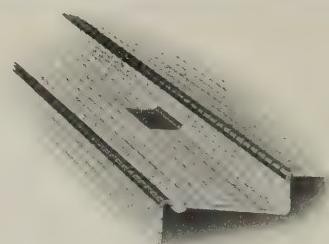


COPING around the swimming pool serves a triple purpose. First, it limits the possibility of water from the gangway floor flowing into the pool. This water on the runways is usually very much polluted from suit and body drippings, sputum and effete matter. In the second place, it prevents water used in cleaning the runways from running or splashing into the pool. Lastly, it serves as a "take-off" in competitive swimming. If the pool is to be used for competitive contests, Rule IX, Sec. 1, of the Intercollegiate Swimming Rules provides that "the maximum height for the take-off shall be 18 inches above the water level."

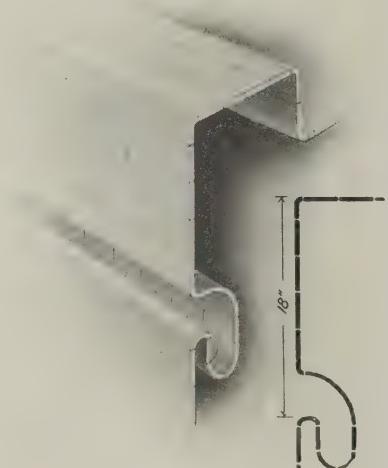
The width of the curb is determined by the length of the human foot. A width of twelve inches provides a comfortable foot rest, and sixteen inches is even better.

The height of the nosing above the runway must be determined by attendant conditions. It should be at least two or three inches in height to effectively prevent soiled water from running into the pool. The usual height is six inches. A substantial and beautiful spring-board rest is sometimes installed as a part of the curb. Its purpose and construction do not require explanation.

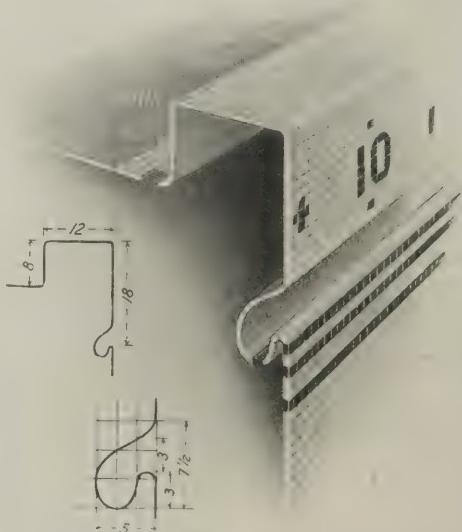
*Holyoke High School, Holyoke, Mass.  
Tile Spring-board Rest*



A Special Type of Open Scum Gutter.  
(A) with hand rail.  
(B) without hand rail.



Design for wall tile gutter and curb. The water level is eighteen inches below the top of the curb, the proper take-off distance.



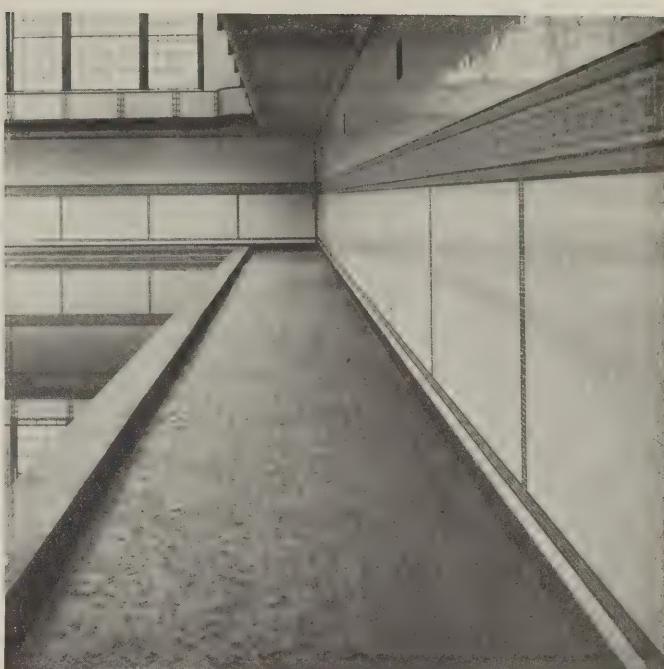
This profile in every detail is in conformity with all requirements. The gutter is small and neat. The curb is of proper height to serve as a take-off.

## Runways

**S**URROUNDING the pool on all sides should be runways, three to four and one-half feet in width along the sides, and at least six feet at the ends. They should have ample width to prevent congestion and unnecessary collisions. A wide and clear runway is a help to attendants when giving swimming instructions and in cases of emergency.

It is an excellent plan from a hygienic point of view to provide two runways, an outer and an inner one. The inner one should be reserved for the exclusive use of the bathers and be accessible only for those going to and from the dressing rooms. The outer passage is for the accommodation of non-bathing visitors and for newcomers to reach the dressing rooms. This simple plan prevents the soiling of the inner gangway by dirty shoes, one of the frequent sources of contamination of the pool water. The floor of the runway should always be tiled with an unglazed tile. Rubber or fiber mattings are not desirable, for sanitary reasons. The runways should drain away from the pool unless a curb surrounds the pool, in which case it may slope toward a shallow gutter running along the inside of the curb.

This spacious runway has a 2 by 1-inch unglazed tile floor with color inserts in the curb. White glazed tiles are used on the walls and faience mosaic in the pool, wall border and decorative color band.



*Indoor Pool, Y. M. C. A.,  
Huntingdon Ave., Boston, Mass.  
Shepley, Rutan & Coolidge, Architects*



*Private Pool, Hon. J. M. Cox,  
Dayton, Ohio.  
O. C. Hering & D. Fitch, Architects*

This neat pool is lined with  $\frac{3}{4}$ -inch ceramic mosaic; the walls and pillars have white glazed tile squares; the floor panels are of herringbone ceramic mosaic, and the colored borders in walls and floor are faience mosaic.

A low tile partition, four to six inches wide and from thirty to thirty-six inches high, may separate the inner and outer passages. Reinforced concrete, or common brick, should form the foundation upon which the tile work is set. Aside from ceramic mosaic, so-called partition tile is available for this purpose. By judicious use of the different patterns and colors, these partitions can be made to add greatly to the attractiveness of the hall.



*Corridor and Foot Pool, Heckscher Foundation for Children, New York City.*

Maynicke and Franke, Architects

The floor and wainscoting are faience tiles; the foot pool floor is of ceramic mosaic. Note the effective arrangement for control of the bathers. The attendant's office is at the extreme right, next to it is a foot pool through which all must pass before entering pool, and at the left is the exit.

## *Walls and Ceilings*



WIMMING hall and shower rooms are incomplete without provision for the sanitary condition of the walls. It is absolutely necessary to protect them against disintegration.

Condensation of moisture on the walls is unavoidable in the presence of a large body of tepid water. If this moisture is condensed on walls of absorbent, porous material, they will rapidly discolor and deteriorate, paint will peel off and in a general way become unsightly and unsanitary. To thoroughly clean such a wall is next to impossible, for dust and moisture are naturally retained in the cracks and crevices formed in the process of dilapidation. Dr. W. Paul Gerhard, an authority on pools and bath houses, states in this connection: "The walls of the swimming hall should likewise be finished in tiles and the ceiling should also be tiled. Painted brick walls and plastered ceilings are abominations not to be tolerated, because the always present vapors attack these surfaces quickly."

The economical aspect of such treatment is easy of comprehension. Cleansing is simplified, repainting and replastering and other current repair work are eliminated, thus saving money and assuring maximum availability of the pool.



*Shower Room of the Spaulding Pool, Dartmouth College, Hanover, N. H.*

Rich & Mathesius, Architects

Note the attractive wall and ceiling treatment with faience tiles. The ceramic mosaic floor completes a model shower room entirely impervious to splashing and condensation of moisture.

## Shower Baths

**A**N adequate number of shower baths, where each bather is required to bathe preparatory to entering the swimming pool, is a necessary sanitary precaution in every well-planned swimming establishment.

The number of showers depends upon the probable number of patrons; the type and arrangement, in relation to dressing rooms and pool; upon the available space; and the sex and age of the bathers.

Individual showers may be built with each dressing room; or the dressing rooms may be planned in groups of two, three or more, and a shower installed for each group.

In men's colleges and schools, a common dressing and locker room is sometimes provided, with a row of showers in an adjoining room.

Tiles are admirably adapted to the requirements of shower baths. They are, by far, the cleanest, most attractive and most satisfactory material for this purpose.



Shower stalls showing the use of white glazed tiles on the walls, and hexagonal ceramic mosaic on the floor with checkered color border.



Foot Pool and Shower.  
Fall River, Mass.

The walls are white glazed tiles with a dark blue border;  
the floor is laid in ceramic mosaic.

## Foot Pools



RDINARY sanitary precautions and public hygiene call for the use of tiled foot pools in public tanks, natatoriums, and institutional pools used by large numbers of people. Rules generally stipulate that all bathers cleanse their feet thoroughly before entering the pool.

Foot pools or baths can be neatly built into passages or corners in conjunction with a low foot shower, or be located in the annex leading to the shower room. Unglazed tiles and ceramic mosaic make very suitable linings for foot pools.



*Private Pool, Residence of John F. Dodge, Meadowbrook Farms, Rochester, Mich.*

Smith, Hinchman & Grylls, Architects

An excellent private pool. The walls are in six-inch white semi-matt tile and the pool is six-by-three-inch sea green. The floor consists of two-inch hexagonal white tile.

## *Waterproofing*

**G**HE subject of waterproofing is of great importance when building a swimming pool, and particularly an indoor pool located near buildings, where leakage may cause damage to footings and consequent settlement of the buildings. Waterproofing is not of the same importance in pools for gardens, parks and beaches, although any pool should be built watertight if for no other reasons than to insure sanitation of the water and to prevent frost damage.

The use of the scratch coat required in connection with the tile work as a method of integral waterproofing allows great simplification of construction through the elimination of all extraneous waterproofing courses.

## *Site*

Indoor pools are placed either in separate buildings, in the basement, or on upper floors of structures used elsewhere for other purposes, and the choice of a site is determined or restricted by the location of these buildings. Outdoor pools intended for swimming should be located as far from possible sources of contamination as practicable and on sites with good natural drainage. All too frequently outdoor pools are placed at the lowest point, which precludes satisfactory surface and ground water drainage from the start.

## *Construction*

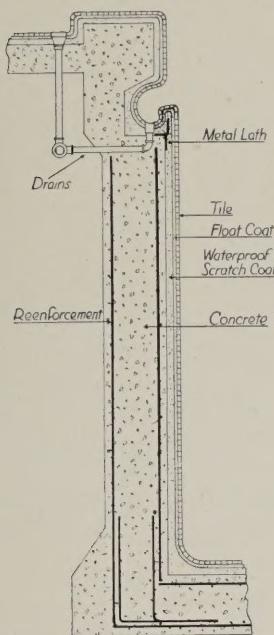
**G**HE most satisfactory form of construction for rough bowls, located on or in the ground, is reinforced concrete, as it assures unity in the structure and requires a minimum quantity of materials.

The determination of the proper thickness of concrete walls and floor and their reinforcement are engineering problems based on the principles of reinforced concrete design and hydrostatic pressure, and as such, are distinctly

the work of an architect or engineer. Frequently the soil strata may be of varying bearing capacity and require special types of footings; the bowl may have to resist excessive groundwater pressure when empty, which is equalized after the pool is filled; when located high above ground the swaying of buildings due to wind, vibration due to nearby transportation lines, and expansion and contraction in the support may have to be taken into consideration. The necessary ratio of cross sectional area of steel to concrete may have to be varied according to

climate and whether the pool is above or below ground. For these and similar reasons no one should proceed with the construction of a pool holding a large volume of water without advice from experts on the ground.

Tiles take less space in swimming pool construction than any other lining material. This is important where space is limited, as it will often allow the size of the pool to be made standard, or the runways can be widened to full width if the extra space is not required in the construction of the pool. From eight to eighteen inches in length and width dimensions can be saved by the use of tiles over other more bulky materials.



Typical Cross Section of Reinforced Concrete Retaining Wall for Swimming Pool, showing structural and waterproofing factors in diagrammatical form.

quired for housing it, the cost is increased by about \$10,000 or \$12,000. Outdoor pools without filtration and heating plants can of course be constructed for materially less. The cost of the tile installation for a 20 x 60 pool will range from \$3500 to \$6000 according to kind of tile, design, labor cost and decorative details.

## Cost



HE cost of constructing a swimming pool varies with location, size, type of construction and equipment. For such types as a standard 20 x 60 size of indoor pool used in schools, Y. M. C. A.'s, etc., including the tile work, filtration plant, sterilizers, heater and cleaning equipment, the cost ranges from \$10,000 to \$14,000. Where the pool cannot be accommodated in the basement and a separate building is re-



ROPER care of a swimming pool is a simple matter requiring only regular attention. It should start right after installation. Such care will add greatly to the pool's appearance, cleanliness, advantages and satisfactory service. Glazed tiles should be washed down regularly with soap, clean cloths or mop, and plenty of clean hot water, with a thorough "rinsing" after cleaning. Abrasive compounds containing grit should not be used. Unglazed tiles should be cleaned regularly with a scouring powder or abrasive compound in much the same manner as glazed tiles. Here again, the use of plenty of clean hot water and clean cloths is most important for the best results.

Particular care should be used to remove all soap from tiled surfaces, particularly runways, by thorough rinsing with clean hot water—otherwise the tiles will steadily accumulate a soapy film of grime and dirt, and become discolored and slippery.

Swimming pools should always be cleaned when empty for a thoroughly satisfactory job. Pools having a recirculating system of water can be cleaned while full with a vacuum system which works in conjunction with the circulating water pump.

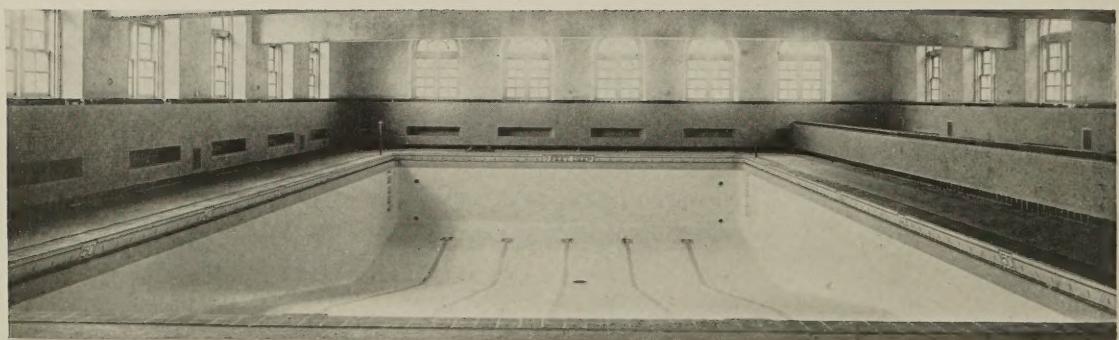
Water stains and rust stains from pipes can be removed with diluted nitric acid. Paint spots will yield to strong ammonia, and oxalic acid will remove ink stains.



HE information on the foregoing pages must of necessity be of a more or less general nature in order to be applicable to the varying conditions under which swimming pools are installed.

We are, however, prepared to make definite and practical recommendations and suggestions, and work out specific problems concerning in any way the sanitary, artistic, economical and durable lining of any swimming pool to be installed under given conditions, and will supply technical information on any feature of their construction.

Architects and prospective builders of swimming pools are therefore requested to avail themselves of our earnest desire to furnish any data pertaining to our product and its application.



*Indoor Pool, Heckscher Foundation for Children, New York City.*

